

FY2017 Season 3 bait skate landing limit analysis for Skate Framework Adjustment 4

Prepared by

Jay Hermesen, Ph.D.

Analysis and Program Support Division
Greater Atlantic Regional Fisheries Office
NOAA Fisheries
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Introduction

The New England Fishery Management Council has initiated a framework to the Northeast Skate Complex Management Plan (FMP) to consider alternatives to the skate bait total allowable landings threshold trigger and to the season 3 possession limit for FY2017. The purpose of this analysis was to examine the distribution of skate bait trips and to analyze the potential effects of reduced possession limits on skate bait season 3 landings in FY2017. The overall goal of the analysis is to lower the possession limit to decrease the probability of reaching the incidental landing limit threshold trigger but still reach the total allowable landing limit for the FY2017 bait skate fishery. Since the beginning of landings monitoring in the skate bait fishery, the incidental possession limit trigger has been invoked twice, both times in FY2016, at the end of Season 1 and in January of 2017, during skate bait Season 3.

Methods

Data sources

Skate bait trip and landings data from fishing years 2010 - 2016 were assembled for this analysis. This time period was chosen because FY2010 was the first year of annual catch limit monitoring and management accountability measures in this fishery. Primary data sources that were used for this analysis include: dealer weighout reports (commercial fishery database system, cfdbs), the vessel permit database, and the fishing vessel trip report (FVTR) database. Dealer-reported bait skate landings information for the time period under consideration were filtered by fishing vessel federal permit status, i.e. a fishing vessel must have held an active federal fishing permit at the time of landing to be included in this analysis (and the bait skate management unit). Fishing vessel trip report data for skate data coded for use as 'bait and home consumption' supplemented the dealer-reported skate bait landings data. Again, a fishing vessel must have held an active federal fishing permit at the time of landing to be included in the management unit for this action and bait skate fishery monitoring in general.

Skate bait landings data were summarized by fishing year, bait season (Season 1: May-July; Season 2: August-October; Season 3: November- April), month, day and trip. Summary data were used to characterize landings from FY2010-2016 by fishing year, season and month.

Skate bait trip-level data from FY2012-2015 were used to characterize the distribution of trips by landed weight by season and fishing year. This four-year period was chosen as the sampling unit because the possession limit of 25.000 was consistent throughout the period and the distribution of landings was unaffected by a reduction in possession limits (as in FY2016). The combined trip-level distribution was then employed to estimate FY2017 Season 3 landings under a range of alternative landing limits.

Assumptions

- The distribution of landings on trips during Bait Season 3 of FY2017 will be similar to the distribution of trips that took place during the study period, FY2012-2015.
- The same number of trips in Bait Season 3 of FY2017 that would have landed greater than an updated possession limit will land the designated possession limit.
- The method also relies on the assumption that a reduced possession limit will not affect the number of trips either positively or negatively.

There is no empirical basis for modifying these assumptions going forward. The uncertainty associated with these assumptions should be understood in the selection of any management alternatives.

Results and Discussion

Skate bait landing limit analysis

Skate bait landings from FY2010-2016 averaged approximately 11 million lbs per year (Table 1, Figure 1). The overall skate bait TAL was exceeded slightly in two of those seven years, in 2015 and 2016 (Table 1, Figure 1). Landings by bait season have remained fairly consistent over the time period, with two notable exceptions: a large relative increase in season 3 landings in FY2015 and a decrease in season 3 landings in FY2016, which was the result of a six-week long reduction in the skate bait possession limit (Figure 2). Skate bait landings by month fluctuated over the course of the fishing year, with landings peaking between July and September (Figure 3). Cumulative landings illustrate this cyclicity as well, cumulative landings increased relatively quickly in the first half of the fishing year and slowed down during the latter half (Figure 4).

The number of trips by landed weight for 2012-2015 appears to be log-normally distributed with a high degree of skewness toward smaller trips (Figure 5). The distribution of Season 3 trips for 2012-2015 appears slightly less skewed than the all-season distribution due to a relatively higher frequency of larger trips (Figure 6). The empirical cumulative distributions of landings and trips for all seasons of FY2012-2015 indicate that although half of the trips occur at

or below approximately 2500 lbs., the relationship between the proportion of landings and trip size is approximately linear (Figure 7). The empirical cumulative distributions of landings and trips in Season 3 for FY2012-2015 appear similar to the all-season distributions but reflects the relatively higher landings per trip (Figure 8).

An incremental lowering of the landing limit for Season 3 trips for FY2012-2015 reduces estimated Season 3 average landings non-linearly (Table 2, Figure 9). As would be expected from the distributions of trips and landings in this fishery, a higher proportional reduction in the landings limit would be needed to reduce landings by a particular amount, e.g. for a 23% reduction in landings (~4.6 to ~3.6 million lbs.) would require an approximately 50% reduction in the trip limit (from 25,000 lbs. to 12,000 lbs.).

Approximately 32% of the approximately 9.3 million lb. annual skate bait TAL is allocated for Season 3 in FY2017, which amounts to approximately 3 million lbs. A possession limit of approximately 10,000 lbs will result in estimated landings of approximately 3 million lbs. Increasing the trip limit over that amount to, for example, 12,000 lbs. would likely increase the probability that the entire skate bait TAL would be landed in FY2017, but might also increase the probability of a short closure near the end of Bait Season 3. Industry feedback on an acceptable possession limit is crucial to a thorough consideration of all options. The assumption that all trips that would have taken place above a certain trip limit will occur at the new trip limit is likely reasonable in a scenario where any new landing limit is relatively close to the 25,000 lb limit. As possession limit alternatives go lower, the reliability of the assumption of a static number of trips likely decreases. It is therefore incumbent upon managers to consider the feedback of industry when considering which possession limit alternatives will be economically viable.

Modification to skate bait incidental landing limit trigger

In FY2016, in response to the attainment of the skate bait landings trigger, the skate bait possession limit was lowered to 1,135 lbs. on January 30, 2017. The skate bait possession limit was raised to 9,307 lbs. approximately 6 weeks later, on March 15, 2017. During the 6-week period of the 1,135 lb. possession limit, skate bait landings slowed considerably, averaging approximately 770 lbs. per day (Figure 4). This situation raises the option to consider a relatively high landing limit reduction trigger, e.g. 98% or 99% of the TAL, because it can be assumed that if the possession limit were to be lowered to 1,135 lb, landings are reduced considerably.

Table 1. Management measures and landings, bait skate fishery 2010-2016

Fishing year	Bait Season	Possession Limit	Total Allowable Landings (TAL)	Landings	Percent of TAL Landed
2010	1	20,000	3,149,985	2,723,468	86%
2010	2	20,000	3,794,300	3,930,699	104%
2010	3	20,000	3,282,939	3,588,582	109%
2010 Total			10,227,224	10,242,749	100%
2011	1	20,000	4,904,589	2,816,933	57%
2011	2	20,000	5,907,801	3,592,387	61%
2011	3	20,000	5,111,601	4,403,212	86%
2011 Total			15,923,991	10,812,532	68%
2012	1	25,000	4,904,590	3,715,962	76%
2012	2	25,000	5,907,801	3,709,374	63%
2012	3	25,000	5,111,601	4,392,012	86%
2012 Total			15,923,992	11,817,348	74%
2013	1	25,000	4,904,590	3,454,505	70%
2013	2	25,000	5,907,801	4,623,608	78%
2013	3	25,000	5,111,601	4,256,549	83%
2013 Total			15,923,992	12,334,662	77%
2014	1	25,000	3,727,108	3,041,104	82%
2014	2	25,000	4,489,471	3,358,116	75%
2014	3	25,000	3,884,421	3,514,175	90%
2014 Total			12,101,000	9,913,395	82%
2015	1	25,000	3,727,108	2,541,085	68%
2015	2	25,000	4,489,471	3,714,076	83%
2015	3	25,000	3,884,421	6,418,153	165%
2015 Total			12,101,000	12,673,314	105%
2016	1	25,000	2,864,122	3,336,616	116%
2016	2	25,000	3,449,965	3,479,261	101%
2016	3	25,000	2,985,010	2,584,870	87%
2016 Total			9,299,098	9,400,747	101%

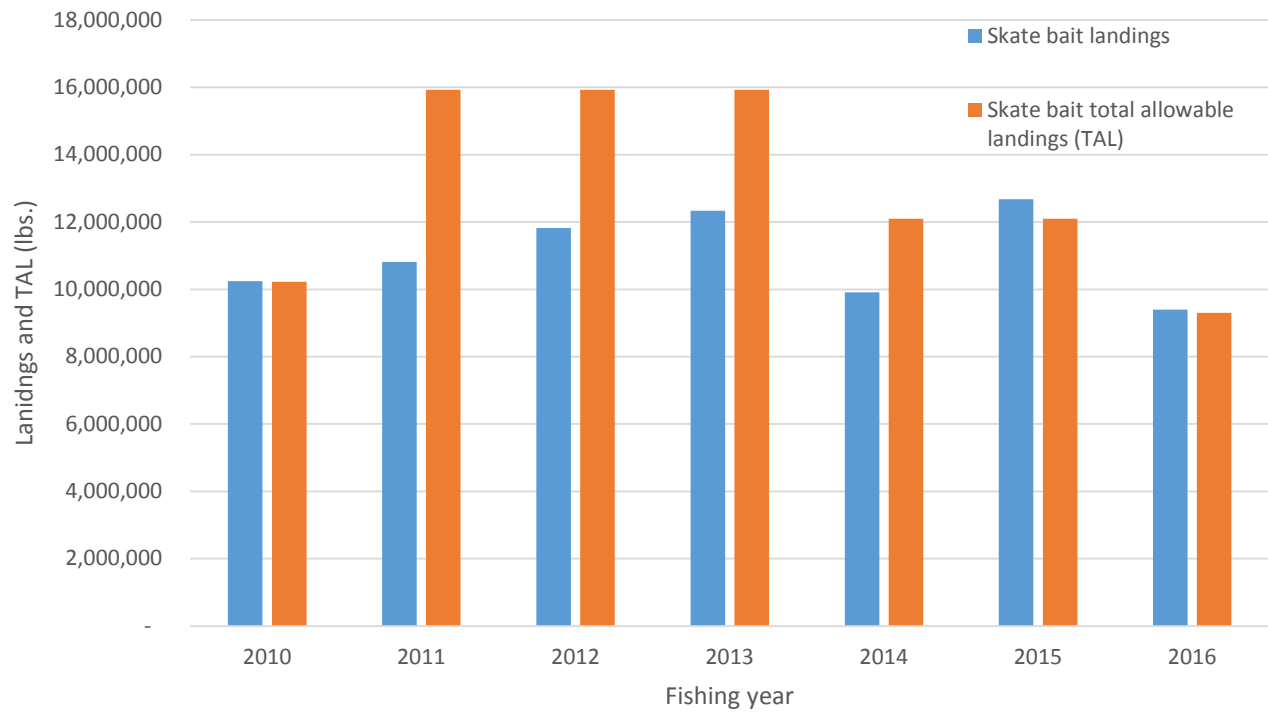


Figure 1. Skate bait landings and total allowable landings by fishing year, FY2010-2016

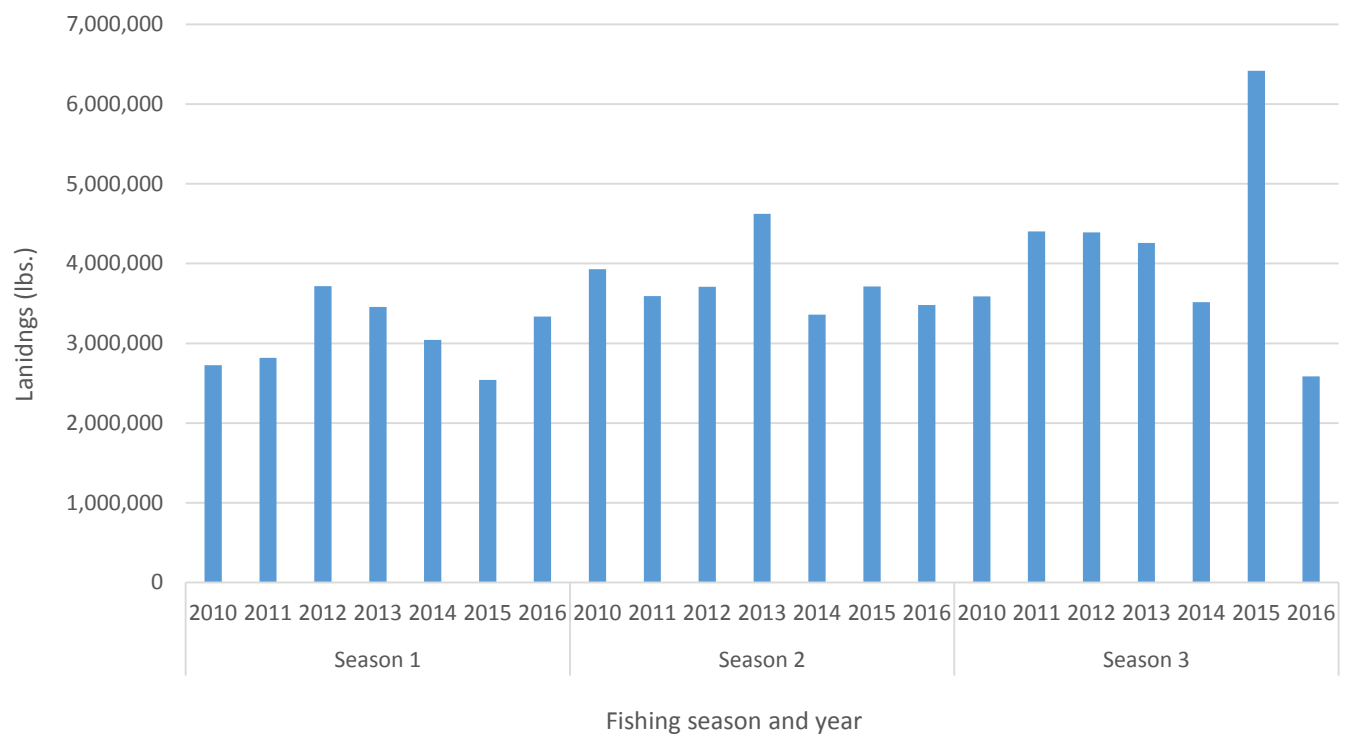


Figure 2. Landings by bait season and fishing year, FY2010-2016

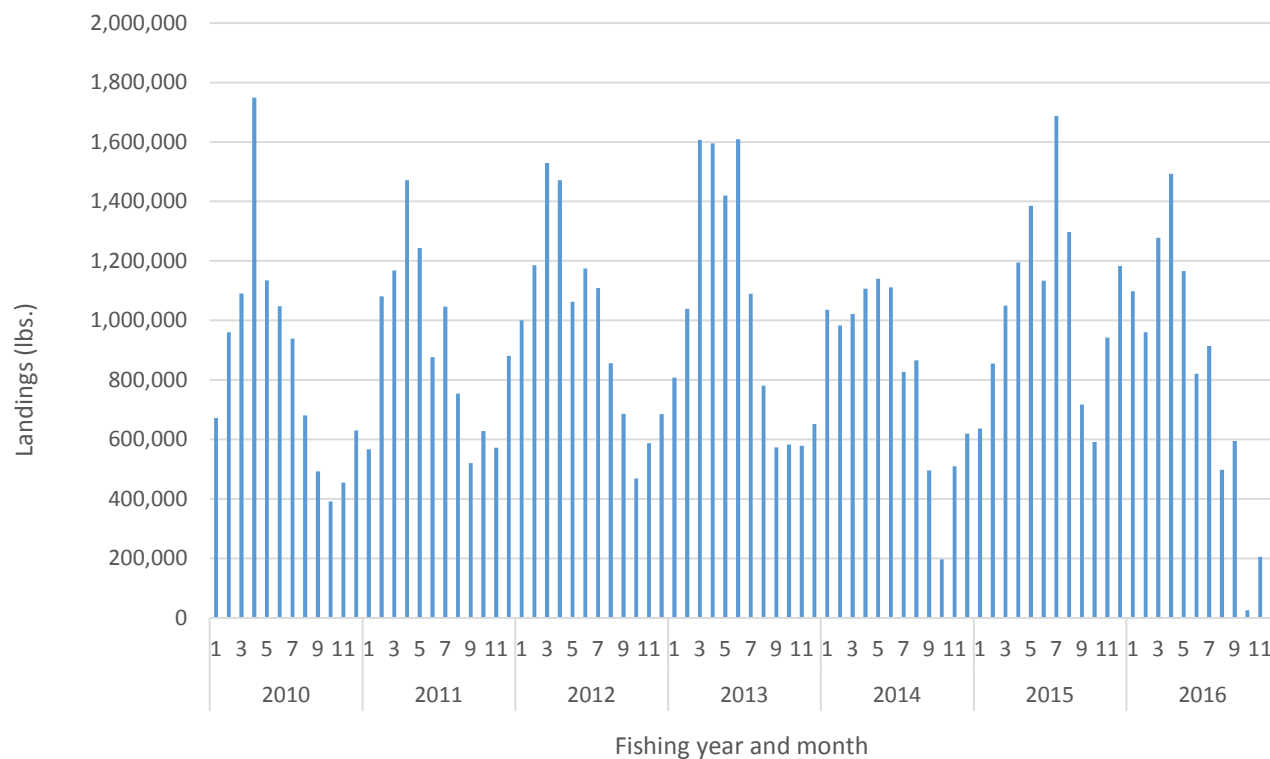


Figure 3. Landings by fishing year and fishing year month, FY2010-2016

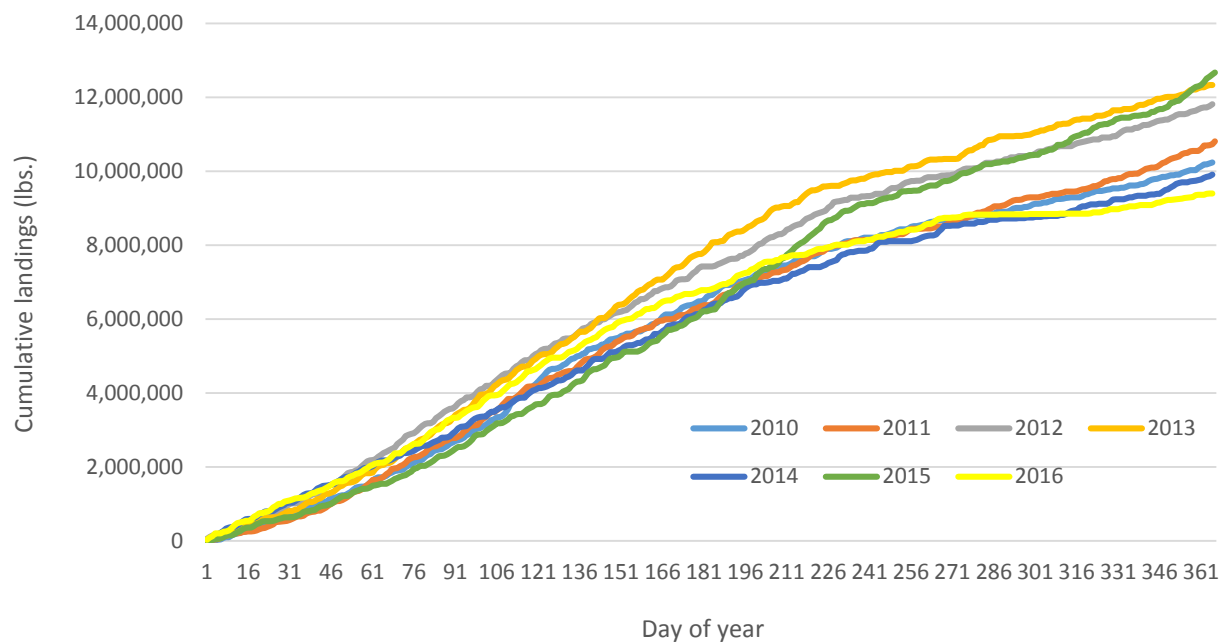


Figure 4. Daily cumulative landings by fishing year, FY2010-2016

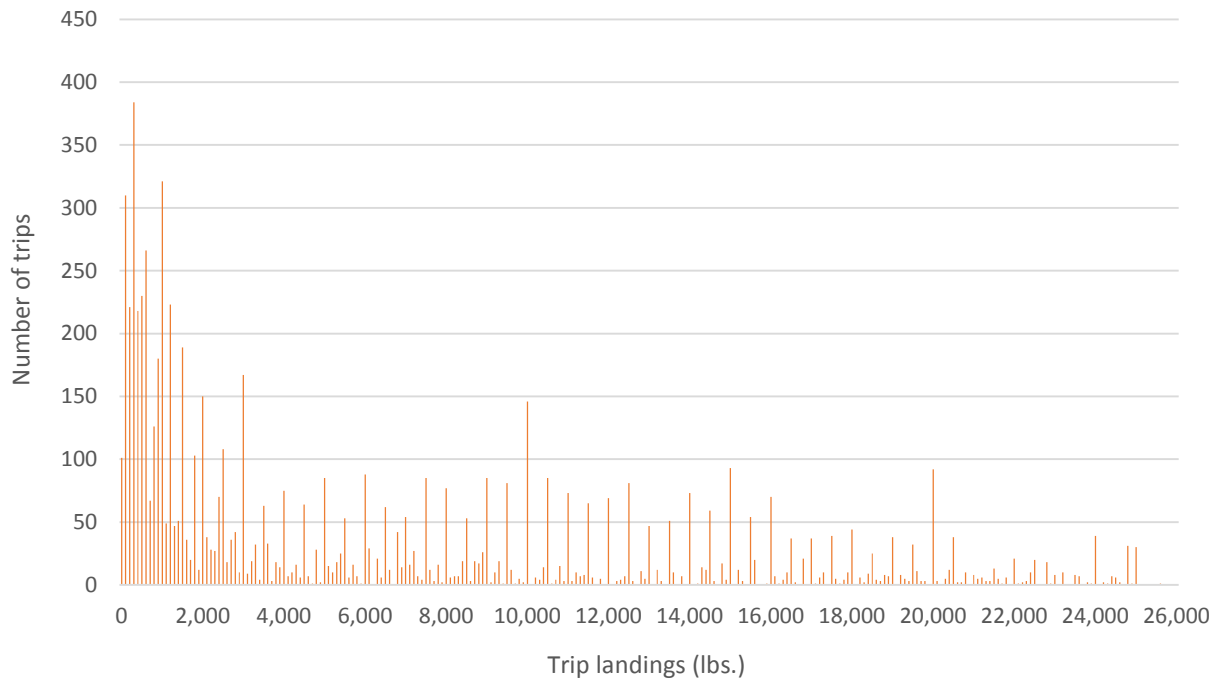


Figure 5. Frequency distribution of bait skate trips for all monitoring seasons, FY2012-2015

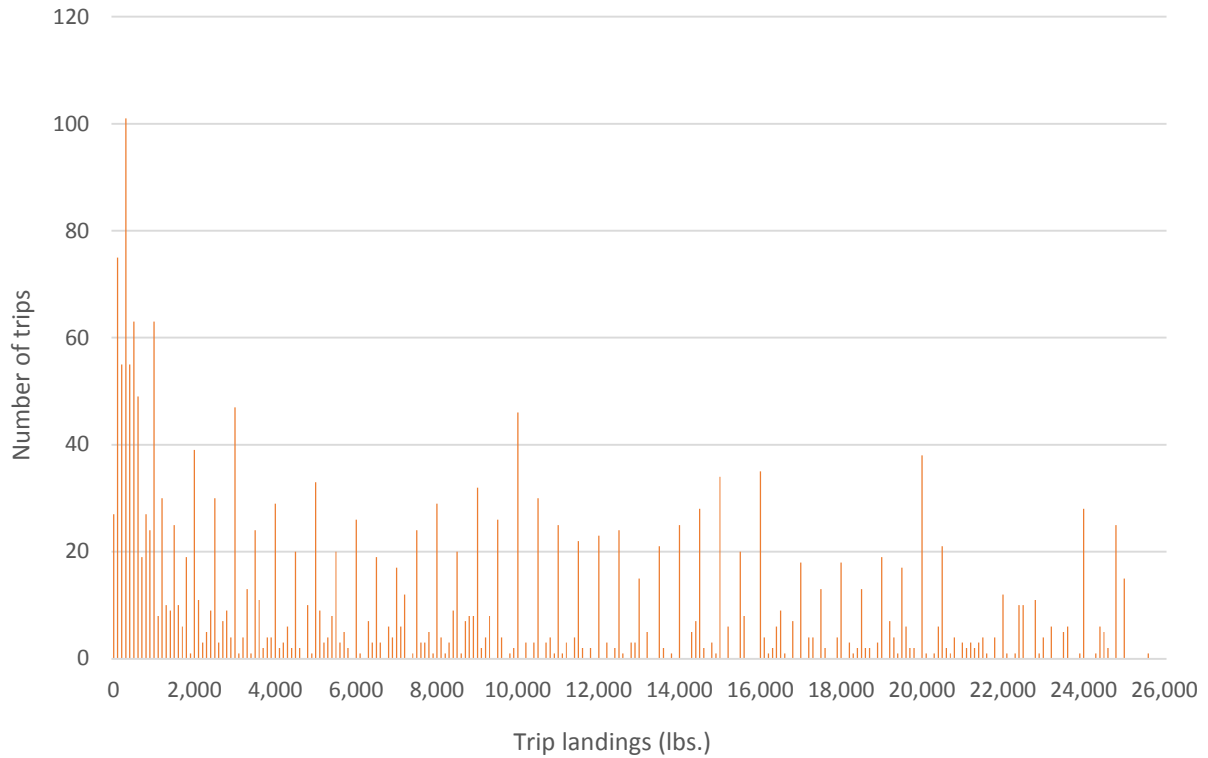


Figure 6. Frequency distribution of bait skate Season 3 trips, FY2012-2015

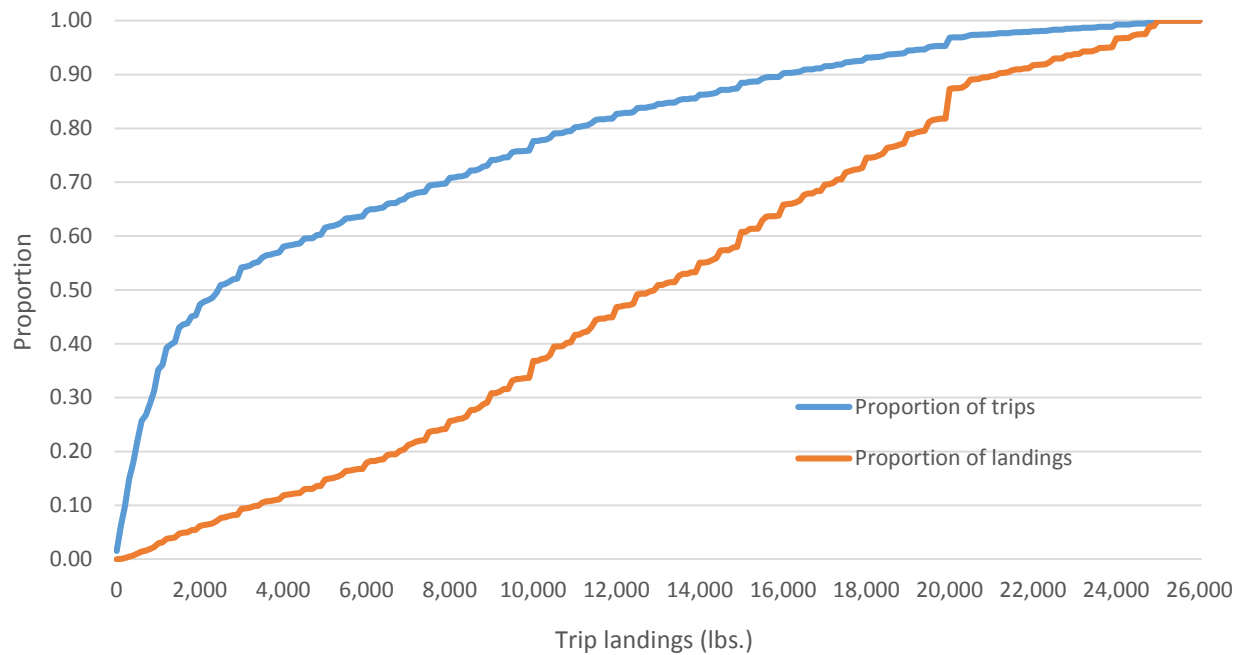


Figure 7. Empirical cumulative distribution function of the proportion of trips and landings by landed pounds, FY2010-2016, all seasons.

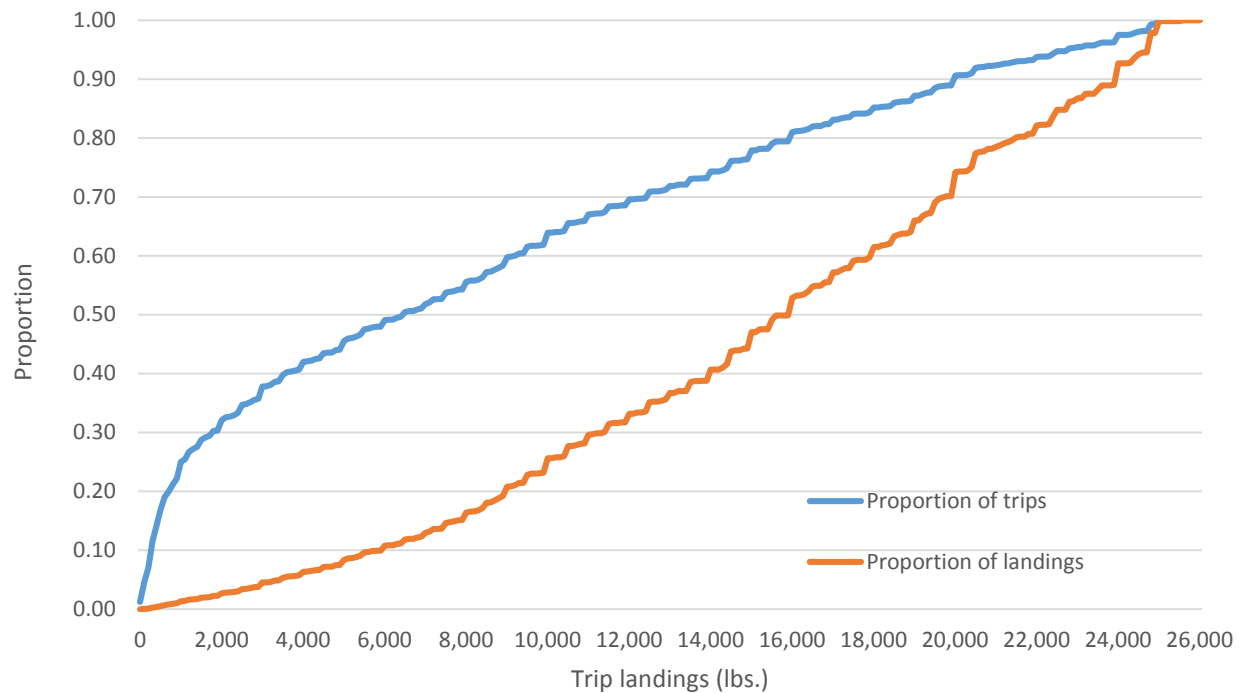


Figure 8. Empirical cumulative distribution function of the proportion of trips and landings by landed pounds, FY2012-2015, bait season 3.

Table 2. Estimated skate bait Season 3 landings over a range of landing limits.

Trip limit	Estimated Season 3 skate bait landings
1,000	480,800
2,000	882,350
3,000	1,250,675
4,000	1,589,425
5,000	1,907,300
6,000	2,203,250
7,000	2,482,025
8,000	2,743,075
9,000	2,984,125
10,000	3,202,225
11,000	3,398,225
12,000	3,577,750
13,000	3,743,275
14,000	3,896,400
15,000	4,034,100
16,000	4,153,100
17,000	4,255,425
18,000	4,346,250
19,000	4,426,125
20,000	4,492,650
21,000	4,540,750
22,000	4,580,850
23,000	4,612,125
24,000	4,635,175
25,000	4,646,025

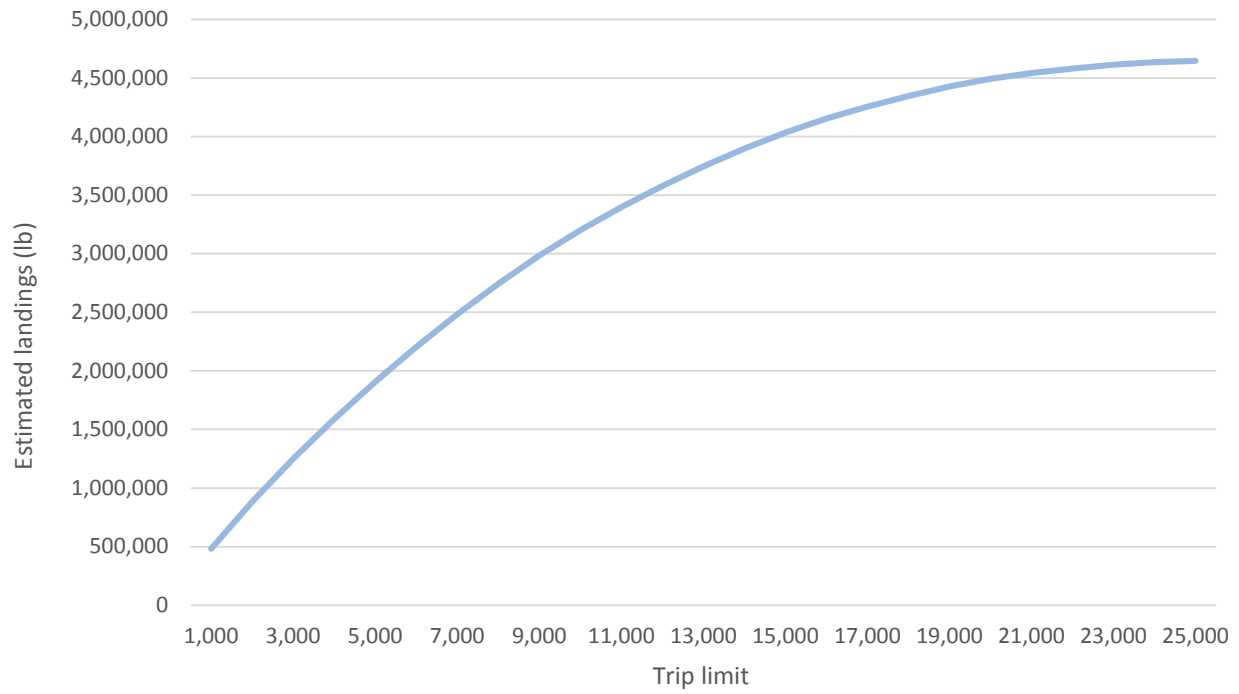


Figure 9. Estimated skate bait season 3 landings by landing limit, derived from FY2012-2015 bait season 3 trips.